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(54) **IMAGE FORMATION BY PASSIVE COLLECTION AND PROCESSING OF RADIO FREQUENCY SIGNALS ILLUMINATING AND SCATTERED BY CULTURAL FEATURES OF TERRESTRIAL REGION**

(75) Inventors: **Gayle Patrick Martin**, Merritt Island, FL (US); **John W. Shipley**, Sebastian, FL (US)

(73) Assignee: **Harris Corporation**, Melbourne, FL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 27 days.

This patent is subject to a terminal disclaimer.

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Related U.S. Application Data

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(51) **Int. Cl.**⁷ **H04H 1/00**

(52) **U.S. Cl.** **455/3.02**; 455/12.1; 455/426.1; 455/427; 342/25; 342/173; 342/174; 342/191; 342/192

(58) **Field of Search** 455/3.02, 422.1, 455/63.1, 12.1, 13.1, 427, 426.1, 423-425, 226.1; 342/25 A, 25 F, 172-178, 191-192

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Primary Examiner—William Trost

Assistant Examiner—Brandon J. Miller

(74) *Attorney, Agent, or Firm*—Allen, Dyer, Doppelt, Milbrath & Gilchrist, P.A.

(57) **ABSTRACT**

An imaging system uses 'RF daylight' created by an RF illumination source, such as a television broadcast tower, to passively generate RF scattering coefficients for multiple points within a prescribed three-dimensional volume being illuminated by the RF transmitter. The scattering coefficients provide a complex interference pattern having amplitude and phase components that contain all information necessary to recreate a three-dimensional monochromatic image of the illuminated scene. Coherent complex correlation provides scene information content that is only a function of scene scattering and collector geometry. The scene information may be coupled to an image utility subsystem, such as a virtual reality simulator, for generation of a three-dimensional image of the illuminated scene.

16 Claims, 3 Drawing Sheets

